



U. S. ENVIRONMENTAL PROTECTION AGENCY  
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OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

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**MEMORANDUM**

SUBJECT: Tier I Estimated Environmental Concentrations of Oxadiazon

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This memo presents the Tier I Estimated Environmental Concentrations (EECs) for oxadiazon, calculated using FIRST (surface water) and SCIGROW (ground water) for use in the human health risk assessment. For surface water, the acute (peak) value is 246 ppb and the annual average value is 100 ppb. The groundwater screening concentration is 0.6 ppb. These values generally represent upper-bound estimates of the concentrations that might be found in surface water and groundwater due to the use of oxadiazon on turf, which is the major use of the chemical.

***Background Information on FIRST:***

FIRST is a new screening model designed to estimate the pesticide concentrations found in water for use in drinking water assessments. It provides high-end values on the concentrations that might be found in a small drinking water reservoir due to the use of pesticide. Like GENEEC, the model previously used for Tier I screening level, FIRST is a single-event model (one run-off event), but can account for spray drift from multiple applications. FIRST takes into consideration the so called Index Drinking Water Reservoir by representing a larger field and pond than the standard GENEEC scenario. The FIRST scenario includes a 427 acres field immediately adjacent to a 13 acres reservoir, 9 feet deep, with continuous flow (two turnovers per year). The pond receives a spray drift event from each application plus one runoff event. The runoff event moves a maximum of 8% of the applied pesticide into the pond. This amount can be reduced due to degradation on field and the

effect of binding to soil. Spray drift is equal to 6.4% of the applied concentration from the ground spray application and 16% for aerial applications.

FIRST also makes adjustments for the percent crop area. While FIRST assumes that the entire watershed would not be treated, the use of a PCA is still a screen because it represents the highest percentage of crop cover of any large watershed in the US, and it assumes that the entire crop is being treated. Various other conservative assumptions of FIRST include the use of a small drinking water reservoir surrounded by a runoff-prone watershed, the use of the maximum use rate, no buffer zone, and a single large rainfall

#### ***Background Information on SCIGROW:***

SCIGROW provides a groundwater screening exposure value to be used in determining the potential risk to human health from drinking water contaminated with the pesticide. Since the SCIGROW concentrations are likely to be approached in only a very small percentage of drinking water sources, i.e., highly vulnerable aquifers, it is not appropriate to use SCIGROW for national or regional exposure estimates.

SCIGROW estimates likely groundwater concentrations if the pesticide is used at the maximum allowable rate in areas where groundwater is exceptionally vulnerable to contamination. In most cases, a large majority of the use area will have groundwater that is less vulnerable to contamination than the areas used to derive the SCIGROW estimate.

#### ***Modeling Inputs and Results:***

Tables 1 and 2 summarize the input values used in the model runs for FIRST 1.0 and SCIGROW, respectively. The lowest non-sand  $K_p$  was used in FIRST 1.0. The median  $K_{oc}$  value was used in SCIGROW. The available aerobic soil metabolism half-life for oxadiazon was extremely high. For FIRST, stability was assumed, while the extrapolated value of 841 days was used in SCIGROW. The modeling results associated with maximum allowable rate per year (4 lb ai/A applied twice at 6 months interval) are presented in Table 3. Attached to this memo are copies of the original printouts generated from FIRST and SCIGROW runs.

cc: Nancy McCarroll (HED)

Table 1. Environmental Fate and Other Input Parameters for the Estimation of Oxadiazon using FIRST

Parameter	Value	Source
Water Solubility (25 °C)	1 ppm	One-Liner
Hydrolysis Half-Life (pH 7)	stable	MRID 41863603
Aerobic Soil Metabolism Half-Life (from 6 values)	essentially stable	MRID 42772801
Aerobic Aquatic Metabolism Half-life	not available	N/A
Aqueous Photolysis Half-Life	2.75 days	MRID 41897201
Soil/Water Partition Coefficient (Lowest non-sand $K_d$ )	16.9	MRID 41898202
Pesticide is Wetted-In	Yes	Labels
PCA (turf)	0.87	Default
Depth of Incorporation (Broadcast)	0.0 inch	Labels

Table 2. Environmental Fate Input Parameters for the Estimation of Oxadiazon using SCIGROW.

Parameter	Value	Source
Organic Carbon Partition Coefficient (median $K_{OC}$ )	2376	MRID 41898202
Aerobic Soil Metabolism Half-Life (median)	841 days	MRID 42772801

Table 3. Modeling Results for Use of Oxadiazon on (Turf) Golf Courses

Parameter	Value	Source
Application Method	Ground Spray	Labels
Application Rate	4.0 lb a.i./A	Registrant
Applications Permitted per Year	2	Registrant***
Application Interval (days)	182	Registrant
FIRST 1.0 Peak Untreated Water Concentration	246 ppb	N/A
FIRST 1.0 Annual Average Untreated Water Concentration	100 ppb	N/A
SCIGROW Ground Water Concentration	0.6 ppb	N/A

\*\*\*The Registrant supports multiple applications, at lower application rates.

## RESULTS OBTAINED USING FIRST

```

RUN No.    1 FOR OXADIAZON          ON    Turf (Golf    * INPUT VALUES *
-----
RATE (#/AC)  No.APPS &    SOIL  SOLUBIL  APPL TYPE  %CROPPED INCORP
ONE(MULT)    INTERVAL    Kd   (PPM )   (%DRIFT)   AREA      (IN)
-----
4.000(  8.000)  2 182      16.9   1.0   GROUND( 6.4)  87.0      .0
  
```

### FIELD AND RESERVOIR HALFLIFE VALUES (DAYS)

```

-----
METABOLIC  DAYS UNTIL  HYDROLYSIS  PHOTOLYSIS  METABOLIC  COMBINED
(FIELD)    RAIN/RUNOFF  (RESERVOIR) (RES.-EFF)  (RESER.)  (RESER.)
-----
.00        0          N/A        2.75- 341.00    .00      341.00
  
```

UNTREATED WATER CONC (MICROGRAMS/LITER (PPB)) Ver 1.0 MAY 1, 2001

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-----
PEAK DAY (ACUTE)      ANNUAL AVERAGE (CHRONIC)
CONCENTRATION          CONCENTRATION
-----
246.388                100.013
  
```

## RESULTS OBTAINED USING SCIGROW

```

RUN No.    1 FOR OXADIAZON          INPUT VALUES
-----
  
```

```

APPL (#/AC)  APPL. URATE    SOIL    SOIL  AEROBIC
RATE         NO. (#/AC/YR) KOC    METABOLISM (DAYS)
-----
4.000        2          8.000    2376.0    841.0
  
```

### GROUND-WATER SCREENING CONCENTRATIONS IN PPB

```

-----
.592986
-----
A= 836.000 B= 2381.000 C= 2.922 D= 3.377 RILP= 1.821
F= -1.130 G= .074 URATE= 8.000 GWSC= .592986
  
```